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**REMARKS**

Claims 1-37 are pending in the present application. In the Office Action mailed June 27, 2003, the Examiner rejected claims 31 and 36 under 35 U.S.C. §112. The Examiner also objected to claims 2 and 13 as being of improper dependent form. The Examiner then rejected claims 1-5, 7, and 18 under 35 U.S.C. §102(b) as being anticipated by Wang (USP 5,928,148). The Examiner next rejected claims 1-8, 11, 12, 18, 21-23 under 35 U.S.C. §102(b) as being anticipated by Yoshitome Japanese laid-open Patent Application (kokai) No. H5-95927. Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshitome. Claims 9, 13-17, 19, 20, 22, 28-30, 32-35, and 37 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshitome Japanese Laid-open Patent Application (kokai) No. H6-311977.

**Procedural Background**

Before substantively addressing the rejection with respect to each claim, Applicant wishes to briefly address the manner by which the present application is being examined. Under MPEP §904.01 the Examiner has a duty to perform a thorough search of the art to substantiate a rejection. Applicant appreciates the thoroughness of the rejection first presented in the Office Action mailed February 11, 2003.

Following a rejection, Applicant then has the right to respond to any rejection and traverse any rejection presented by the Examiner. MPEP §2266. Following a response, the Examiner then has duty to answer all material traversed by Applicant's remarks. MPEP §707.07(f). Specifically, "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." *Id.* "If it is the examiner's considered opinion that the asserted advantages are not sufficient to overcome the rejection(s) of record, he or she should state the reasons for his or her position in the record, preferably in the action following the assertion or argument relative to such advantages." *Id.*

The Examiner provided a rejection of all claims in the Office Action mailed February 11, 2003. As such, Applicant does not dispute that the Examiner has met the first burden of a thorough search. Applicant then responded to the rejection and provided extremely detailed remarks regarding the rejection and traversing such. *See* Response mailed April 15, 2003. However, in the current Office Action, the Examiner has failed to "take note of the applicant's argument and answer the substance of it." MPEP §707.07(f). Rather the Examiner has concluded that "the asserted advantages are not sufficient to overcome the rejection(s) of record" but has failed to "state the reasons for his or her position in the record, preferably in the action following

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the assertion or argument relative to such advantages." MPEP §707.07(f). Therefore, the Examiner has failed to meet the second burden under MPEP §707.07(d).

Rather than answer Applicants' traversing remarks, the Examiner has provided a near verbatim recitation of the previous rejection. That is, the current rejection includes some introductory comments rejecting Applicant's traversal and then repeats the previous rejection. Applicant recognizes that the Examiner sprinkled the previous rejection with sparse sections of edited text, however, the additions and deletions do not, in any way, come near to meeting the burden imposed by MPEP §707.07(f). To illustrate this point and secure it in the record, Applicant has provided herein a copy of the Examiner's rejection with the few sections containing changes from the previous rejection highlighted. That is, if the Examiner added statements to a section, the exact text that was added is bracketed and underlined and if the Examiner deleted text, the deleted text is handwritten above the section from where it was deleted. As illustrated by quantity and quality of the added text, Applicant believes the statements added by the Examiner fall far short of what is required by MPEP §707.07(d).

Additionally, the Examiner indicated that she believed a telephonic interview may be helpful to resolving outstanding issues. However, while Applicant believes telephonic interviews may be very helpful in instances where the Examiner has sufficiently reviewed and considered Applicant's position, in the present case Applicant does not believe the Examiner is sufficiently appraised of Applicant's position to make a telephonic interview productive. Simply, as evidenced by the lack of a substantive response addressing Applicant's arguments, Applicant believes a telephonic interview is premature. Accordingly, Applicant incorporates herein the arguments presented in the Response of April 15, 2003, so that the Examiner may be given the opportunity to reconsider those remarks that were previously presented. Only after such reconsideration is complete does Applicant believe a telephonic interview would be productive.

#### **Rejections under §112**

The Examiner rejected claims 31 and 36 lacking antecedent basis for the claim of "MR data" because claim 28, which 31 and 36 depend from, does not claim an "MR system." However, by the Examiner's own statement, "in general magnetic field gradients, are applied in MRI imaging but not other non-MRI medical imaging systems, such as ultrasound, or fluoroscopy," the Examiner acknowledges that one skilled in the art would readily recognize that the claimed computer program may be implemented in an MR system. Therefore, the Examiner's statement acknowledges that in claim 28 the acquisition of the 3D k-space data may be carried out with an MR imaging system. As such, claims 31 and 36 are not inconsistent with claim 28.

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However, claim 28 does not require an MR system for data acquisition as suggested by the Examiner. As defined by claim 28, the medical image scanner must be able to apply encoding magnetic field gradients which may or may not be an "MRI scanner."

Furthermore, though the Examiner states that claims 31 and 36 lack antecedent basis, claims 31 and 36 do not contain articles preceding "MR data." Therefore, the term "MR data" in claims 31 and 36 does not rely on claim 28 for antecedent basis. Rather, claims 31 and 36 further define the invention called for in claim 28. That is, claims 31 and 36 further limit the acquisition process called for in claim 28 to necessarily acquiring MR data. The Examiner appears to be reading limitations into the claims that are not present. While the Examiner is to give claim terminology its broadest meaning, the Examiner is not permitted to interpret claims contrary to the actual elements of the claims. Simply, claims 28, 31, and 36 contain no "112 problem."

However, when reviewing claim 28, Applicant recognized that the current claim language was somewhat confusing. Therefore, Applicant has amended the claim to clarify the invention. As such, Applicant hopes the Examiner's difficulty interpreting the claims will be resolved.

#### Claim Objections

The Examiner has again objected to claim 2 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. However, the Examiner is again ignoring that which is explicitly claimed. Applicant previously explained that "claim 1 calls for restricting the acquired data, whereas the cited element of claim 2 calls for restricting the excitation." Response mailed April 15, 2003, p. 13. One of ordinary skill in the art will readily recognize that "acquired data" is not the same as "excitation." Clearly, the term "that" preceding "is restricted" in line 7 of claim 1 modifies the term "data" and not "exciting and encoding spins" as suggested by the Examiner. Therefore, claim 2 is in proper dependent form because it further defines the subject matter of claim 1.

The Examiner also objected to claim 13 because of informalities. The Examiner states that Applicant calls for a slab-selective RF pulse to restrict the excitation and then states "(i.e. of what? The excitation which occurs within the slab?, the slab thickness? Or the pulse itself.)." As Applicant already explained in the Response mailed April 15, 2003, claim 13 is dependent upon claim 2, which further defines the step of exciting and encoding spins *as restricting excitation to the slab thickness*. Claims 13 simply adds the step of "applying a slab-selective RF pulse to restrict the excitation..."

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The Examiner also states that "if applicant means that the 'slab-selective RF pulse' has 'linear phase, sharp transitions, and low slice ripple...[t]his feature needs to be more clearly stated, otherwise the features could correspond to the feature of restricted excitation." Applicant previously amended claim 13 for clarification. However, the Examiner has reiterated the previous rejection with and does not even address the amendment. If the Examiner does not understand Applicant's assertion and/or previous amendment, Applicant suggests the Examiner state exactly that which is misunderstood rather than reiterating the previous rejection without addressing Applicant's remarks and amendment. In either case, for the reasons stated, Applicant does not believe claim 13 to contain informalities. Applicant, however, has amended claim 13 to insert a comma after the term "excitation" in line 2 to improve the claim's readability.

#### Rejections Under §102

As stated, the Examiner failed to substantively respond to Applicant's remarks of April 15, 2003. Instead the current rejection is merely a recitation of the previous rejection with minor editing of select portions. Applicant directs the Examiner to the enclosed copy of the Office Action mailed June 27, 2003, which contains brackets and underlines indicating text added since the previous Office Action and handwritten text indicating text that was deleted since the previous Office Action. Due to the fact that the indicated changes do not constitute a substantive addressing of Applicant's arguments, Applicant incorporates herein the Remarks of April 15, 2003, so that the Examiner may provide a substantive response to those remarks.

Specifically, Applicant reiterates that the Examiner is equating terms that according to one of ordinary skill in the art, the plain meaning of the terms, and Applicant's own specification are, by definition, non-equivalent. That is, the Examiner is improperly equating the terms "region of interest," "FOV," "optimal imaging area," "imaged area" or "imaging volume," and "slab" or "slab thickness." Contrary to the Examiner's rejection, the terms have distinct definitions within the art and are not interchangeable. In the Remarks of April 15, 2003, Applicant provided a detailed explanation of each term and the definitional distinctions that render the terms non-equivalent. However, the Examiner ignored these distinctions to perpetuate the current rejection.

Regarding claim 1, the Examiner asserts that "the 'desired large region of interest' in the Wang reference is 'larger than an optimal imaging volume' because Wang uses a series of series of smaller fields of view to collectively span the desired large region of interest." Office Action mailed June 27, 2003, p. 6, ¶ 18. The Examiner makes such a conclusion because, "the examiner considers the desired large region of interest to be a term which covers in scope the applicant's

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desired FOV, because in convention MRI the desired field of view, includes the region of interest that is desired to be imaged.” (emphasis added) *Id.*

The Examiner’s statement exemplifies the improper mindset of the Examiner that provides the basis for this clearly incredulous rejection. Specifically, the Examiner is imputing term definitions that are contrary to the claimed element because the Examiner believes her definitions to be supported by “conventional MRI.” *Id.* However, it is vital that the Examiner understand that Applicant is not claiming “conventional MRI” because that which is claimed is an invention, i.e. not conventional.

Furthermore, this statement is indicative of the Examiner’s propensity to ignore that which is actually claimed in favor of substitute limitations imputed by the Examiner. That is, contrary to what the Examiner asserts, claims 1 actually calls for “defining a desired FOV larger than an optimal imaging volume of an MR scanner.” (emphasis added) The Examiner continues this erroneous equation of distinct terminology by stating that “Wang also teaches and suggests ‘selecting a slab thickness in a first direction that is smaller than the desired FOV (i.e. the ‘desired large region of interest’) ‘of the MR scanner.’” (emphasis added) *Id.* However, the Examiner has not provided any support that the region of interest in Wang is larger than an optimal imaging volume of the scanner.

As clearly shown in the Response of April 15, 2003, one of ordinary skill in the art will readily recognize that the “region of interest” is the overall area of the subject to be imaged, which may or may not require multiple FOVs to image. For example, Wang et al. teaches the use of three FOVs for imaging a “region of interest” from foot to torso. *See* Wang et al. Fig. 3. Wang et al. identifies that “[t]he field of view (FOV) in MR imaging is limited by the volume of the B<sub>0</sub> field homogeneity and the receiver coil size (typically, the FOV<48 cm on current commercial MR scanners.” (emphasis added) Col. 2, lns. 26-30. Wang et al. continues by stating that “[t]he anatomical region of interest in the lower extremity, for example, is about 100 cm and this requires several FOVs, or stations, for a complete study.” (emphasis added) Col. 2, lns. 30-32, emphasis added. Furthermore, the element unaddressed by the Examiner, “within the optimal imaging volume,” is clearly defined by Applicant as the spatial volume with optimal gradient linearity, B<sub>0</sub> and RF homogeneity. *See* Applicant’s Specification, paragraph 4. The Examiner cannot simply ignore explicit definitions provided by the very reference cited by the Examiner to reject some claim elements while just ignoring other claim elements. This is improper.

Applicant is entitled to be his/her own lexicographer, the Examiner not permitted to be Applicant’s lexicographer. The Examiner is not only ignoring explicitly claimed elements and

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the plain meaning of the terms "FOV" and "region of interest" but is even ignoring the very definitions of the terms provided by the art of record. This is clearly improper.

In the Response of April 15, 2003, Applicant pointed out that Examiner also asserted that "Wang *suggests* 'acquiring full encoding data in the first direction for a subset of another two direction;'" See Office Action of February 11, 2003, pg. 6, Emphasis added. Applicant reminded the Examiner that, by definition, a rejection under § 102(b) must "describe" each and every element of the claim, not "suggest" it. In the current Office Action, the Examiner has, without explanation, reiterated the rejection but edited the cited statement to state that "the Wang reference meets the criteria for..." instead of Wang "suggests." The Examiner does not provide any basis for the Examiner's new interpretation of Wang. As such, Applicant does not believe such is proper. Furthermore, a rejection under §102(b) must "teach" or "describe" each and every element of the claim." See MPEP § 2131. Applicant is uncertain what the Examiner means by "meets the criteria for..." but does not believe this interpretation establishes that which is required by 35 U.S.C. §102(b).

However, the Examiner did note that this "claimed limitation fails to require or suggest *how* the 'subset of said another two directions' are encoded." "Therefore a reference that has at least full encoding in one direction meets the requirements of this limitation." First, claims do not "teach" and therefore do not need to teach "how." There is no support in the MPEP, the CFR, or substantive case law to support the Examiner's assertion that the claims "teach." The Examiner is referred to the detailed description for a "teaching" of the invention. Second, Applicant believes the Examiner's statement to be incorrect and that the Examiner has not provided a "reference that has at least full encoding in one direction." Wang et al. teaches collecting all k-space data for a FOV, not "acquiring MR data that includes acquiring full encoding data in the first direction for a subset of another two directions." See Wang et al., Col. 6, lns. 52-65 and Fig. 6. Therefore, Wang et al. does not teach "acquiring full encoding data in the first direction for a subset of another two directions," as called for in claim 1.

By the Examiner's admission, Wang et al. does not teach acquiring full encoding data in the first direction for a subset of another two directions. The Examiner has failed to give any patentable weight to the limitation claim because of the Examiner's belief that Applicant must claim "how" the subsets are encoded. As is generally well-known, the claims define the metes and bounds of the invention, and the specification enables the claims. Accordingly, Applicant's "claiming" of full encoding data acquisition in the first direction for a subset of another two

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directions absent the art of record's teachings of such a step further defines the patentability of that called for in claim 1. That is, the art of record, by the Examiner's own admission, fails to teach this feature and, as such, claim 1, given the other patentable distinctions from that taught and/or suggested by the art of record, is clearly in condition for allowance.

Regarding the remaining two elements of claim 1, "step-wise moving one of the optimal imaging volume and an imaging object" and "acquiring another set of MR data between each step-wise movement until the desired FOV is imaged," the Examiner failed to provide any substantive response to Applicant's previous remarks. As exemplified by the bracketed and underlined sections of paragraph 21 of the accompanying, marked-up copy of the current Office Action, the only difference between the current rejection and the previous rejection of February 11, 2003, is the additional citation of "Figures 4, 5, 6, and 8" and "Figure 6, Figure 5." Applicant does not believe these minor additional citations serve to meet the burden under MPEP §707.07(f). Furthermore, Applicant fails to see the relevance of the additional citations because Wang et al. does not teach step-wise moving one of the optimal imaging volume and an imaging object or acquiring another set of MR data between each step-wise movement until the desired FOV is imaged. Wang et al. teaches step-wise movement of the patient table between multiple FOV acquisitions until the region of interest is imaged. See Fig. 6 of Wang et al. and Component 376 of Fig. 6 of Wang et al. Therefore, the Examiner's citations do not overcome Applicant's previous remarks regarding the patentability of the claimed subject matter over Wang et al. but actually incorporate the very basis for Applicant's distinctions - Fig. 6.

Therefore, for all of these reasons, claim 1 is patentably distinct from the art of record. As such, claims 2-17 are in condition for allowance pursuant to the chain of dependency. Nevertheless, should the Examiner attempt to continue this improper rejection, Applicant respectfully requests any subsequent Office Action "take note of the applicant's argument and answer the substance of it" as required under MPEP §707.07(f).

Regarding claim 18, in the Response of April 15, 2003, Applicant provided nearly two full pages of detailed analysis and argument in traversing the rejection. In response to Applicant's thorough remarks, the Examiner has simply reiterated the previous rejection without any attempt to address Applicant's remarks. Specifically, the only difference between the current rejection and the previous rejection is the redundant addition of a citation to "Figure 1" in paragraph 27 and an additional sentence and a half near the end of paragraph 28. See Marked-up copy of the Office Action mailed June 27, 2003, enclosed. Specifically, the Examiner merely added that the rejection of claim 1 is reiterated because "these limitations are just equivalent

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repetitions of the limitation of claim 1” and that “[a]dditionally the programming components are shown in Figure 1 and taught in col. 3, line 66 through col. 5 line 20.” This additional sentence-and-a-half falls well short of an answer to the substance of two pages of remarks provided by Applicant. See MPEP §707.07(f). Additionally, the Examiner’s citation of Figure 1 and col. 3, line 66 through col. 5 line 20 are completely unresponsive to Applicant’s remarks in that the cited sections merely provide a recitation of the normal functionality of an MR imaging apparatus. As such, Applicant believe the remarks regarding claim 18 in the Response of April 15, 2003, and incorporated herein, clearly define claim 18 over the art of record.

Specifically, claim 18 calls for, in part, incrementing “the patient table while maintaining position of the fixed slab; and repeat[ing] the acquire and increment acts until an MR data set is acquired across the desired FOV.” Wang et al. makes no such teaching and, the Examiner’s citation to Fig. 1 and col. 3, line 66 through col. 5, line 20 is unsupportive of the Examiner’s assertion. That is, in the cited sections, Wang et al. teaches dividing the region of interest into multiple FOVs, translating the table between the FOVs, and once data from all the FOVs is acquired, the FOV images are “combined to form a single image of the much larger region of interest.” Col. 7, lns. 1-22. Wang simply does not teach incrementing “the patient table while maintaining position of the fixed slab; and repeat[ing] the acquire and increment acts until an MR data set is acquired across the desired FOV.” With reference to claim 18, Applicant claims a specific sequence in its computer to receive input..., define a fixed slab..., acquire full MR data in a direction of table motion, defined as z-direction, for a selected  $k_x$ - $k_y$  subset in the fixed slab, increment the patient table while maintaining position of the fixed slab, and repeating the acquisition and increment acts until an MR data set is acquired across the desired FOV to reconstruct an image of the FOV. This series of acts creates a loop called for in the last element of claim 18 (i.e. “repeat the acquire and increment act”) that is clearly not taught, or even suggested, by Wang et al. Therefore, claim 18 is patentably distinct from the art of record. Accordingly, claims 19-27 are in condition for allowance pursuant to the chain of dependency.

Regarding the rejection of claim 1-8, 11, 12, 18, and 21-23 as anticipated by Yoshitome, Applicant incorporates herein the remarks of the Response of April 15, 2003. Specifically, Applicant provided a full page of remarks traversing the rejection by showing that claim 1 calls for, in part, “exciting and encoding spins to acquire data that is restricted to the selected slab thickness.” In contrast, Yoshitome teaches directly away from this, by stating that “echo data  $K(i)$  is collected using a sequence with the same gradient and number of samples as when



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imaging the entire imaging range." Page 2, constitution paragraph. Simply, Yoshitome teaches encoding an imaging range larger than the imageable region.

In response to Applicant's remarks, the Examiner merely reiterated the previous rejection without explanation. Applicant refers the Examiner to pages 10-18 of the accompanying marked-up copy of the Office Action mailed June 27, 2003. As can be clearly seen by the bracketed and underlined sections representing newly added material and the handwritten sections representing deleted material, the Examiner has not provided any substantive response to Applicant's arguments. Rather the bulk of the changes consist of deleting the word "suggests" without basis or explanation.

Regarding claim 1, Applicant refers the Examiner to page 11, paragraph 32 of the June 29, 2003 Office Action which states that "Yoshitome suggests." As explained in the previous Response, by definition, a rejection under § 102(b) must "describe" each and every element of the claim, not "suggest" it. Since it is apparent that the bulk of the Examiner's changes when reiterating the previous rejection was to remove the word "suggests" from the majority of rejections, Applicant believe the Examiner must have intended to allow the word "suggest" to remain in paragraph 32 because the term "suggests" was removed from three subsequent paragraphs where the removal was unnecessary because the Examiner asserted that the reference "teaches and suggests." As such, the Examiner is apparently making an admission that Yoshitome does not teach but only suggests "exciting and encoding spins to acquire data that is restricted to the selected slab thickness" and "acquiring MR data that includes acquiring full encoding data in the first direction for a subset of another two directions." Accordingly, the rejection under §102(b), by the Examiner's own statement, cannot be sustained.

Therefore, the rejection of 1-8, 11, and 12 fails under two criteria. First, the Examiner failed to meet the burden of noting and addressing the substance of Applicant's previous remarks required under MPEP §707.07(f). As such, Applicant believes the rejection was successfully traversed. Additionally, the Examiner admits that Yoshitome merely suggests "exciting and encoding spins to acquire data that is restricted to the selected slab thickness" and "acquiring MR data that includes acquiring full encoding data in the first direction for a subset of another two directions." Simply, the Examiner has failed to address Applicant's remarks in traversal and cannot substantiate a rejection under §102(b) by mere "suggestion." MPEP §2131. Therefore, claim 1 is patentably distinct from the art of record. As such, claims 2-8, 11 and 12 are in condition for allowance pursuant to the chain of dependency.

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Regarding claim 18, the Examiner has again failed to substantively respond to Applicant's remarks. As illustrated in the accompanying marked-up copy of the Office Action mailed June 27, 2003, the Examiner merely added "Figures 1, 8, 15, 16" to paragraph 44 and deleted two occurrences of the word "suggests." As such, Applicant refers the Examiner to the remarks of the Response mailed April 15, 2003, and incorporated herein, so that the Examiner can provide a proper response in accordance with MPEP §707.07(f).

In accordance with the Response mailed April 15, 2003, Applicant believes claim 18 is allowable because the Examiner's only support for the rejection is under "the same reasons that were already given in the rejection of claim 1." However, since Applicant has already shown the Examiner's reasons for rejecting claim 1 are improper, no basis for rejecting claim 18 remains. Therefore, claim 18 is patentably distinct from the art of record. As such, claims 21-23 are in condition for allowance pursuant to the chain of dependency.

#### **Rejections Under §103**

Regarding claim 28, despite detailed remarks in the Response of April 15, 2003, the Examiner has merely provided a verbatim recitation of the previous rejection. Again, this is improper. As previously shown, the Examiner is required by the MPEP to substantively respond to Applicants remarks in traversal of a rejection. *See* MPEP §707.07(f).

Yoshitome teaches that "echo data is collected using a sequence with the same gradient and number of samples as when imaging the entirety of the above imaging range." Page 2, constitution paragraph and Page 5, paragraph 0006. Therefore, Yoshitome teaches directly away from applying "magnetic field gradients to encode the region in the first direction" and acquiring "3D k-space data in the first direction for a subset of a second and third direction" as claimed. That is, Yoshitome teaches imaging as if encoding the entire "imaging range larger than the imagable region." Page 2, constitution paragraph. Therefore, the Examiner's non-responsiveness notwithstanding, Applicant believes claim 28 is patentably distinct from the art of record.

Regarding the Examiner's rejection of claim 10 under 35 U.S.C. §103(a) as being unpatentable over Yoshitome (No. H5-95927), claims 9, 13-17, 19, 20, 22, 29-30, 32-35, and 37 under 35 U.S.C. §103(a) as being unpatentable over Yoshitome (H6-311977), and claim 31 under 35 U.S.C. §103(a) as being unpatentable over Yoshitome (H6-311977) in view of Wang et al. under 35 U.S.C. §103(a), Applicant respectfully disagrees with the Examiner with respect to the art as applied. However, in light of each of the aforementioned claims depending from what is believed an otherwise allowable claim, Applicant does not believe additional remarks are

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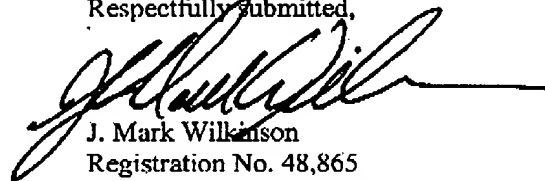
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necessary and therefore requests allowance for claims 9, 10, 13-17, 19, 20, 22, 29, 30-35, and 37 pursuant to the chain of dependency.

Therefore, in light of the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-37.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,



J. Mark Wilkinson  
Registration No. 48,865  
Direct Dial 262-376-5016  
[jmw@zpspatents.com](mailto:jmw@zpspatents.com)

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**P.O. ADDRESS:**  
Ziolkowski Patent Solutions Group, LLC  
14135 North Cedarburg Road  
Mequon, WI 53097-1416  
262-376-5170